

TALITHA UNIT

APPROVAL OF THE APPLICATION TO FORM THE TALITHA UNIT

Findings and Decision of the Director
of the Division of Oil and Gas
Under a Delegation of Authority
from the Commissioner of the State of Alaska
Department of Natural Resources

NOVEMBER 12, 2020

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I. INTRODUCTION AND DECISION SUMMARY

The Department of Natural Resources, Division of Oil and Gas (“Division”) received the Application to form the Talitha Unit (the “TAU”)(the “Application”), on August 6, 2020 from the proposed TAU Working Interest Owners, Great Bear Petroleum Ventures II, LLC (“Great Bear”) and Borealis Alaska, LLC (“Borealis”). The proposed TAU covers approximately 44,463.00 acres. Attachments 1 and 2 set out the proposed Exhibits A and B.

“A unit must encompass the minimum area required to include all or part of one or more oil or gas reservoirs, or all or part of one or more potential hydrocarbon accumulations.” 11 AAC 83.356(a). Great Bear has submitted confidential geological, geophysical, and engineering data that demonstrate that the area approved for formation includes all or part of multiple potential hydrocarbon accumulations.

The Division finds the formation of the TAU, promotes conservation of all natural resources, promotes the prevention of economic and physical waste, and provides for the protection of all parties of interest, including the State. AS 38.05.180(p); 11 AAC 83.303. I approve the Application under the terms and conditions of Section IV. The effective date of the formation of the TAU is November 10, 2020 (“Effective Date”).

II. APPLICATION AND LEASE SUMMARY

Great Bear submitted the Application on August 6, 2020, and subsequently paid the \$10,000.00 unit formation application filing fee, in accordance with 11 AAC 83.306 and 11 AAC 05.110(d)(3)(D), respectively. The Application included: the unit operating agreement, the State only unit agreement form, Exhibit A (Attachment 1), legally describing the proposed unit area, its leases, and ownership interests; Exhibit B (Attachment 2), a map of the proposed unit; and Exhibit G, Plan of Exploration (Attachment 3), for the TAU. Great Bear also submitted evidence of notice to proper parties. The Application also included confidential economic and technical data.

The Division notified Great Bear by email dated August 20, 2020, that the Application was incomplete. The initial Application did not include the following items required under 11 AAC 83.306: (1) the unit agreement executed by the proper parties; (2) Exhibit A to the unit operating agreement to verify the provided unit operating agreement covered the lands in the proposed TAU; (3) evidence that all proper parties to the unit agreement were invited to join the unit. (4) all pertinent geological, geophysical, engineering, and well data, and interpretations of those data, directly supporting the application. The deficiencies were resolved, and the Division deemed the Application complete on September 4, 2020.

The Division published a public notice in the *Anchorage Daily News* on September 17, 2020 and in the *Arctic Sounder* on September 17, 2020, under 11 AAC 83.311. Copies of the Application and the public notice were provided to interested parties. DNR provided public notice to the North Slope Borough, the City of Barrow, the City of Nuiqsut, the Kuukpik Corporation, the Arctic Slope Regional Corporation (ASRC), the Nuiqsut Postmaster, the Barrow Postmaster, the radio station KBRW in Barrow, as well as the Alaska Department of Environmental Conservation, the Alaska Department of Fish and Game, the Alaska Oil and Gas Conservation Commissioner, and the ADF&G Division of Habitat. The public notices invited interested parties and members of the public to submit comments by October 19, 2020. No comments were received.

The proposed unit is described in Attachments 1 and 2.

III. DISCUSSION OF DECISION CRITERIA

A unit may be formed to conserve the natural resources of all or a part of an oil or gas pool, field, or like area when determined and certified to be necessary or advisable in the public interest. AS 38.05.180(p). Conservation of the natural resources of all or part of an oil or gas pool, field or like area means “maximizing the efficient recovery of oil and gas and minimizing the adverse impacts on the surface and other resources.” 11 AAC 83.395(1).

The DNR Commissioner (the “Commissioner”) reviews applications related to units under 11 AAC 83.303–395. By memorandum dated June 30, 2016, the Commissioner approved a revision of Department Order 003 and delegated this authority to the Division Director.

The Commissioner will approve a proposed unit upon a finding that it will (1) promote conservation of all natural resources, including all or part of an oil or gas pool, field, or like area; (2) promote the prevention of economic and physical waste; and (3) provide for the protection of all parties of interest including the state. 11 AAC 83.303(a).

In evaluating these three criteria, the Commissioner will consider (1) the environmental costs and benefits of unitized exploration or development; (2) the geological and engineering characteristics of the potential hydrocarbon accumulation or reservoir proposed for unitization; (3) prior exploration activities in the proposed unit area; (4) the applicant’s plans for exploration or development of the unit area; (5) the economic costs and benefits to the state; and (6) any other relevant factors, including measures to mitigate impacts identified above, the commissioner determines necessary or advisable to protect the public interest. 11 AAC 83.303(b).

A discussion of the subsection (b) criteria, as they apply to the Application, is set out directly below, followed by a discussion of the subsection (a) criteria.

A. Decision Criteria considered under 11 AAC 83.303(b)

1. Environmental Costs and Benefits

The proposed area is habitat for various mammals, waterfowl, and fish. Area residents may use this area for subsistence hunting and fishing. Oil and gas activity in the proposed unit area may affect some wildlife habitat and some subsistence activity. DNR develops lease stipulations through the lease sale process to mitigate the potential environmental impacts from oil and gas activity.

DNR also considers environmental issues during the lease sale process, and the unit Plan of Operations approval process. Alaska statutes require DNR to give public notice and issue a written finding before disposal of the state’s oil and gas resources. AS 38.05.035(e); AS 38.05.945; 11 AAC 82.415. In the written best interest finding, the Commissioner may impose additional conditions or limitations beyond those imposed by law. AS 38.05.035(e). The TAU leases are subject to extensive mitigation measures addressing issues such as siting facilities, impacts to fish and wildlife, risk from hazardous substances, fuel, and waste. Great Bear must comply with these mitigation measures for operations within the unit area.

Approval of the TAU formation has no direct environmental impact. This decision is an administrative action and does not authorize any on-the-ground activity. The unit formation does not entail any environmental costs in addition to those that may occur when permits to conduct lease-by-lease exploration or development are issued. The Unit Operator must obtain approval of a plan of operations from the State and permits from various agencies on State leases before drilling a well or wells or initiating development activities to produce reservoirs within the unit area. 11 AAC 83.346. Potential

effects on the environment are analyzed when permits to conduct exploration or development in the unit area are reviewed. Great Bear will operate under an approved plan of operations and the plan of exploration attached.

2. Geological and Engineering Characteristics

a. Prior Exploration Activities in the Talitha Unit Area

The proposed TAU encompasses 44,463.00 acres of State Leases in the central North Slope area. The proposed unit lies directly adjacent to the southern border of the recently-approved Alkaid Unit (“AKU”), 20 miles south of the Prudhoe Bay Unit (“PBU”), and 25 miles southeast of Kuparuk River Unit (“KRU”).

The TAU area has been part of scattered exploration efforts since the 1960s, and remains lightly explored, despite its proximity to the Dalton Highway and Trans-Alaska Pipeline. The only well drilled in the proposed TAU area is the Pipeline State 1 well, which was drilled in 1988 by the Atlantic Richfield Company (“ARCO”).

During the 2012 through 2016 winter acquisition windows, Great Bear acquired five new proprietary 3D surveys covering approximately 1,000 square miles near the proposed TAU. The 2012 Great Bear/Alcor, 2013 Dalton, and 2014 Great Bear/Niksik 3D surveys are the most relevant to the TAU proposed boundary. Great Bear used these seismic surveys to map depth of structure, fault patterns, and amplitude anomalies associated with potential reservoirs.

b. Previous Exploration (1969–2012)

The first wells drilled in the TAU area were drilled in the late 1960s and early 1970s. The Toolik Federal 1 and Toolik Federal 2 wells were both drilled by ARCO in 1969 north of the proposed TAU area. The Toolik Federal 1 well was drilled first to the northeast of the TAU area, and targeted the Ellesmerian section (Ivishak), as well as Jurassic (Kingak) and Cretaceous (Kuparuk) intervals. The well has a limited logging suite, but conventional core was acquired from several intervals. The Brookian section has oil shows in both the core and recorded in mud logs. The well was not flow tested and has since been plugged and abandoned.

The Toolik Federal 2 well was drilled northwest of the TAU leases shallower than the Toolik Federal 1 well. It only penetrated down to the Kingak and encountered thin Kuparuk C. Like the Toolik Federal 1, the Toolik Federal 2 also has oil shows in the Brookian section. The well was not flow tested and has since been plugged and abandoned.

In the early 1970s, exploration companies turned their attention to shallower targets in the TAU area. In 1973, the North Franklin Bluffs Unit 1 was drilled by ARCO, targeting Tertiary gas northeast of the TAU area. The well is very shallow (3,500 feet True Vertical Depth (“TVD”)) and has a limited logging suite. It has been plugged and abandoned.

In 1974 Mobil drilled the West Kadleroshilik 1 well to the east of the TAU area. This well is also quite shallow (3,700 feet TVD) and has a limited logging suite, but sidewall cores of the shallow formations were successfully acquired. The intention was to test the Tertiary and Cretaceous intervals, but the well was drilled 1,500 feet shallow of the planned depth. There are few indications of gas on the mud logs, and two drill stem tests returned no fluid to surface. The well has been plugged and abandoned.

ARCO returned to the TAU area in 1988 and drilled the Pipeline State 1 well to target the Kingak and Kuparuk formations. This well is the only well located on the proposed TAU acreage. The well penetrated

through the Kuparuk, and the mud logs record both oil and gas shows in the Brookian and Kuparuk intervals. Both the Brookian and the Kuparuk sections were cored. The well was not flow tested in any zone, and the well has been plugged and abandoned.

In 1991 Conoco targeted Canning turbidites and Kuparuk reservoirs with the Sequoia 1 well north of the TAU area. Shows were noted in both the Brookian section of the well and the Kuparuk, as well as minor cementation in the Kuparuk. Sidewall cores were acquired in the Canning and Staines intervals. The well was not flow tested in any zone and the well has been plugged and abandoned.

Eni US Operating Company drilled the Maggiore 1 well in 2007 to evaluate the Schrader Bluff Formation northwest of the TAU area. Sidewall cores were acquired in the Schrader Bluff, but no flow test was attempted. Some shows were noted in the Brookian section. The well was plugged and abandoned.

c. Recent Exploration (2012–Present)

The Alcor 1 well was the first well drilled within the AKU area, northeast of the proposed TAU acreage. Great Bear spudded the well in June of 2012 and reached a final depth of 10,812 feet Measured Depth (“MD”) (10,802 feet TVD), having penetrated numerous formations that produce conventionally elsewhere on the North Slope, including the Kuparuk and Ivishak formations, as well as the unconventional targets, the Hue Shale/HRZ, Kingak, and Shublik formations. A comprehensive logging suite was acquired in the Alcor 1 well, and conventional core was successfully collected in the Hue Shale, Kingak, Shublik, and Ivishak formations, but no flow test was attempted. The mud logs record shows in the Brookian section. The well was subsequently plugged and abandoned.

Great Bear spud the Merak 1 well northeast of the TAU area in August of 2012, immediately after the Alcor 1 well was drilled. The Merak 1 well reached a final depth of 11,094 feet MD (11,081 feet TVD), and penetrated the same formations seen in the Alcor 1 well, including the Kuparuk and Ivishak formations, as well as the unconventional targets, the Hue Shale/HRZ, Kingak, and Shublik formations. A comprehensive logging suite was acquired in the Merak 1 well, and conventional core was successfully collected in the Hue Shale, Kingak, Shublik, and Ivishak formations, but no flow test was attempted in this well, either. The well was subsequently plugged and abandoned.

After the Alcor 1 and Merak 1 wells were drilled, Great Bear suspended further exploration of the area until February of 2015, when the Alkaid 1 well was spud (northeast of the TAU area). The Alkaid 1 well was planned to be drilled to the Kuparuk, but TD was called early before the entire Brookian interval had been penetrated (8,595 feet MD, 8,485 feet TVD). A comprehensive logging suite was acquired in Alkaid 1, and sidewall cores were taken in the Brookian. Operational issues tied to the flooding of the Sag River prevented flow testing of the well at this time, and the well was suspended.

After the merger of Pantheon Resources and Great Bear to form the operating company Great Bear Pantheon in early 2019, the Alkaid well was re-entered and successfully flow tested. A six-foot interval of the well was perforated (8,158–8,164 feet MD) in Upper Brookian sands, and a one-stage hydraulic fracture treatment was initiated to stimulate the well. The hydraulic fracture treatment screened out, but flow was achieved from these perforations. The well test started after the completion of fracturing and perforation. In summary, the well was flowed for approximately 24 hours and produced a total of 108 barrels of oil at 38 °API and 300 barrels of water. The final gas oil ratio (GOR) stabilized at 800 standard cubic feet per stock tank barrel at the end of the test. The well was gas lifted during the test. Two shallower zones were tested, in addition to these deeper perforations. Water was recovered from the West Sak Formation (5,378–5,398 feet MD). The Ugnu Formation also is interpreted to be wet. Upon completion of the flow test, the Alkaid 1 well was suspended again.

d. Geologic and Engineering Characteristics of the Reservoirs and Potential Hydrocarbon Accumulations

Geologic, geophysical, and engineering data submitted by Great Bear to the Division in support of the Application includes interpretations of 3D seismic data, seismic attribute analysis, structure maps, interval isopachs, and net pay maps integrating seismic and well data, interpreted well logs and proprietary petrophysical analyses, well correlations, and geologic cross sections from wells within the proposed unit and surrounding area. All proprietary data and interpretations will be held confidential in accordance with AS 38.05.035(a)(8)(C).

e. Kuparuk C Reservoir Potential

The Kuparuk C sandstone is one of the major reservoirs on the North Slope with a long history of production from numerous fields, most notably within the KRU. The sandstones were deposited on a shallow marine shelf in paleo-topographic lows that formed primarily because of late Jurassic- and Cretaceous-aged rift faulting. This depositional setting results in dramatically variable sand thicknesses and aerial extent of individual sand bodies. The sandstones were deposited directly above the Lower Cretaceous Unconformity (“LCU”), one of the major unconformities on the North Slope. The sandstone in the Kuparuk C interval is believed to be sourced primarily from erosion of older sandstones that subcrop below the LCU. Within the KRU, erosion and reworking of the underlying, aurally-pervasive Kuparuk A sandstones provided much of the source sediments, though increased chert content in the Kuparuk C sandstones argues for contribution from provenance areas with Ivishak and older Ellesmerian formations exposed at the LCU. Outside the KRU, Kuparuk C sandstone is distributed irregularly.

Great Bear integrated available subsurface control from well data with various seismic attributes to predict the presence of Kuparuk C sandstone within the proposed TAU. Kuparuk C sandstone generally displays high impedance that may produce a strong peak amplitude anomaly above the LCU when present. However, due to interference effects of different underlying subcropping strata and the limits of seismic data to resolve both the top and the base of the sandstone when the interval is thin, the amplitude patterns can be complex and sometimes misleading. This can be further complicated by the common presence of dense secondary siderite cement, either in the Kuparuk sandstone or in a thin transgressive lag deposited at the unconformity, which can give a strong amplitude signature, but result in significantly diminished reservoir quality.

Siderite cementation and glauconite content are the primary controls on reservoir quality in the KRU, causing great variability in porosity and permeability. Core data reveal porosity can range from 8% to 30% and permeability can range from less than 0.1 millidarcy (md) to over 3,000 md. In areas with little cementation, the Kuparuk C sandstone has demonstrated the capability to produce at very high rates from relatively thin sandstones.

Numerous smaller accumulations of Kuparuk C sandstone have been discovered and developed outside the KRU. Currently, Kuparuk C sandstone is in production at the Oooguruk Unit (“OOU”), three accumulations at the PBU (Aurora, Borealis, and Midnight Sun), and two separate accumulations in the Colville River Unit (“CRU”) (Fiord-Kuparuk and Nanuq-Kuparuk Participating Areas). The Kuparuk C reservoir is the main target of the Mustang project in the Southern Miluvec Unit which briefly test produced in 2019, and the interval was a key objective for the formation of the Placer Unit. The Kuparuk C is also prospective in the Pikka Unit (“PKU”).

Within the proposed TAU, the Pipeline State 1 well encountered the Kuparuk C sandstone. Thirty feet of core were recovered from the Kuparuk, and it was described as “very fine-grained sandstone”. The mud

log records an oil show in the Kuparuk interval. Even given the vagaries of exploring for Kuparuk C sandstones, it is possible Kuparuk oil may eventually be produced within the proposed unit area.

f. Brookian Reservoir Potential

The Brookian sequence has become the focus of much of the exploration activity on the North Slope in recent years. The sections of the Brookian that have drawn the most interest from explorers have been the shelf edge deposits (e.g. Nanushuk Formation) and the time-equivalent slope and basin floor fans (e.g. Torok Formation), both of which can be distinguished at the seismic scale.

Major east- and northeast-flowing river systems originating in what is now the Chukchi Sea and western Brooks Range filled the Colville Foreland basin from west to east during Aptian to Cenomanian (Early to mid-Cretaceous) time, building an advancing continental terrace topped by coastal plain, river deltas, shoreline, and shallow marine shelfal environments. This style of basin fill created large scale clinoform packages that are readily imaged in seismic data. The clinoform systems are differentiated into (1) non-marine to shallow marine topset strata and (2) deepwater slope to basinal foreset and bottomset strata.

The shelf edge deposits comprise the sand-prone topset units, deposited inboard of the shelf edge. The slope and basin floor fans were deposited in lower slope, toe-of-slope, and proximal basin floor environments, and generally contain significant packages of turbidite and other sediment-gravity flow sandstones that bypassed the shelf and upper slope, particularly during lowstand cycles, and came to rest on the lower gradient seafloor.

At the same time, still further out into the basin floor setting, slow deposition of very fine clay, volcanic ash, and organic matter created the black shale source rock facies of the HRZ Shale.

Reservoir sandstone bodies may occur in various sizes and shapes in both the shelf edge deposits and the slope and basin floor fans. River-dominated deltas on the shelf edge and submarine fans may produce lobate reservoir geometries, whereas shelf-edge deltas or forced-regressive shorefaces and various lower slope to proximal basin floor systems may create thin, elongate bodies that can extend 10–20 miles north-south along depositional strike.

Sandstones from these settings are generally very fine to fine grained and well sorted to very well sorted. The sandstones consist chiefly of quartz, chert, sedimentary and metamorphic lithic grains (rock fragments), with varying amounts of clay matrix and accessory minerals.

Soft lithic components make these Brookian sands susceptible to compactional porosity reduction upon deep burial, but this is not a major issue near the Barrow Arch, where potential Torok and Nanushuk reservoirs currently lie mostly between 4,000 feet and 6,000 feet and were never buried to dramatically greater depths by younger Brookian strata. In areas where the sandstones are buried deeper, reservoir quality (particularly permeability) suffers.

As noted above, Brookian deepwater sandstones are compositionally like their equivalents on the shelf edge, but the deposition is controlled more by sediment gravity processes and turbidity flows rather than deltaic or shelf processes. For this reason, deposits of basin floor fan sandstones may consist of thinner individual sandstones interbedded with finer-grained siltstone and shale, depending on sediment supply, local basin floor topography, and other factors.

The hydrocarbon potential of the Brookian interval across the North Slope Basin cannot be ignored. Within the CRU, one zone of the Nanushuk Group, the informally designated Qannik sandstone, is currently being developed with seven producing wells and three injection wells. Based on interpretation of available seismic data, regional subsurface mapping, and multiple flow tests, Oil Search Alaska

believes that several Nanushuk sandstones are prospective within the PKU, which is currently in the early development stage. The CRU Nanuq-Nanuq PA and the modest development of the OOU Torok PA represent the only long-term Torok Formation production to date. ConocoPhillips's Moraine program at KRU also produces from the Torok Formation, but it is still early in development.

The only well with a flow test from the Brookian interval in the TAU area is the Alkaid 1 well. See description above.

Great Bear has mapped prospective shelf edge and slope basin fan deposits within the TAU using 3D seismic and information gleaned from the Pipeline State 1 well, including mud logs that record hydrocarbon shows in the Brookian interval. Given the result of the Alkaid 1 well test nearby, the Brookian section could potentially be productive in the TAU as well.

g. Conclusions

Great Bear provided the Division comprehensive interpretation and analysis of the available data in support of the Application. The Application included interpretations of 3D seismic data, seismic attribute analysis, structure maps, interval isopach, and net pay maps integrating seismic and well data from wells within the proposed unit and surrounding area, well correlations, and geologic cross sections. There have been no hydrocarbons flowed to surface from any well within the TAU acreage, but interpretation of 3D seismic and analyses of the Pipeline State 1 well has led Great Bear to identify multiple potential hydrocarbon accumulations over a large area in several stratigraphic intervals.

Review of the confidential data and interpretations of that data provided by Great Bear reasonably supports their claim that the unit encompasses the minimum area required to include all or part of multiple potential hydrocarbon accumulations ("PHA"). The area encompassing the PHAs, although meeting the regulatory requirement for inclusion in a unit, will require extensive drilling, testing, and additional delineation work to determine its commercial viability.

3. Plans of Exploration

Great Bear submitted an initial Unit Plan of Exploration ("POE") as part of the Application (Exhibit G to the Unit Agreement), and met with the Division for a technical presentation on April 8, 2020, with multiple pre-application conferences and meetings subsequently. This POE is approved by this decision and is included as Attachment 3.

In the POE, Great Bear commits to several "non-drilling" activities, including reprocessing approximately fifty (50) square miles of 3D datasets to determine the optimal drilling target for the Talitha A well, engineering work to explore input to the Trans Alaska Pipeline System via a "hot tap", as well as additional GOR and reservoir modeling.

Additionally, Great Bear commits to drilling two wells: the Talitha A and the Talitha B. The Talitha A will be drilled in the Winter of 2021, and the Talitha B will be drilled in the Winter of 2022.

The Division approves the proposed POE, as attached. The initial POE is effective November 12, 2020 through November 11, 2022. A second POE is due on August 13, 2022.

4. The Economic Costs and Benefits to the State and Other Relevant Factors

The TAU will provide economic benefits to the State through royalty and tax payments on production if development occurs. Unitized development conducted under the TAU Agreement provides for development of all the unitized leases as a single lease, rather than development conducted on a lease-by-

lease basis. Unitized development maximizes oil and gas recovery, promotes conservation, prevents waste, and protects all of the parties of interest.

Specifically, the activities outlined by Great Bear in the POE for the TAU will provide useful subsurface data to evaluate hydrocarbon potential in Kuparuk and Brookian formations in an area that is currently underexplored.

B. Decision Criteria considered under 11 AAC 83.303(a)

1. Promote the Conservation of All Natural Resources

A unit may be formed under AS 38.05.180(p) “[t]o conserve the natural resources of all or a part of an oil or gas pool, field, or like area.” Conservation of the natural resources of all or part of an oil or gas pool, field or like area means “maximizing the efficient recovery of oil and gas and minimizing the adverse impacts on the surface and other resources.” 11 AAC 83.395(9). The unitization of oil and gas reservoirs or accumulations and the formation and expansion of unit areas to develop hydrocarbon-bearing reservoirs or accumulations are well-accepted means of hydrocarbon conservation. Unitization, with development occurring under the terms of a unit agreement, can promote efficient evaluation and development of the State’s resources, and minimize impacts to the area’s cultural, biological, and environmental resources.

Great Bear’s proposed exploration activities will be supported by winter ice road and ice pad operations in lieu of constructing gravel roads and pads. The use of ice roads and ice pads promotes conservation of natural resources and minimizes physical damage to fragile North Slope tundra.

2. The Prevention of Economic and Physical Waste

Unitization, as opposed to activity on a lease-by-lease basis, may prevent economic and physical waste. Economic waste is often referred to as the drilling of more wells than are necessary for efficient recovery or delineation of the oil and gas in place. Physical waste, among other things, includes the inefficient, excessive, or improper use of, or unnecessary dissipation of reservoir energy.

Unitization may also prevent economic and physical waste by eliminating redundant expenditures for a given level of production, or by avoiding loss of ultimate recovery with the adoption of a unified reservoir management plan. Annual approval of the TAU development activities as described in future plans of development must also provide for the prevention of economic and physical waste.

3. The Protection of All Parties of Interest, Including the State

The people of Alaska have an interest in the development of the State’s oil and gas resources to maximize the economic and physical recovery of the resources, AS 38.05.180(a). Approval of the formation of the TAU under the terms of the TAU Agreement requires future annually approved plans of development. This will provide the Division with continued review and approval of Great Bear’s plans to ensure the TAU is developed in a manner which will maximize economic and physical recovery. Combining interests and operating under the terms of the TAU Agreement and TAU Operating Agreement assures an equitable allocation of costs and revenues commensurate with the resources.

The TAU formation protects the economic interests of the WIOs and the State. The formation promotes the State’s economic interests because hydrocarbon recovery will be maximized, and additional production-based revenue will be derived from the increased production. Diligent exploration and development under a single approved unit plan without the complications of competing leasehold interests promotes the State’s interest. Operating under the TAU Agreement provides for accurate

reporting and record keeping, State approval of plans of exploration and development and operating procedures, royalty settlement, in-kind taking, and emergency storage of oil and gas, all of which will further the State's interest.

Due to the lack of exploration within the proposed TAU, to protect the State's and public interest the State requires the following commitments from Great Bear, which are contained within in the TAU Agreement:

(a) Great Bear must post a performance bond in the amount of \$3.3 million no later than September 15, 2021.

(b) Great Bear must drill one well within the initial two (2) years, or two wells within the initial four (4) years of the TAU

If the bond is not posted by the deadline, the Unit automatically terminates. Additionally, failure to achieve commitment (b) will result in the forfeiture of their performance bond after four (4) years from the Effective Date and automatic Unit termination after five (5) years from the Effective Date.

The work commitments established in the TAU Agreement and POE protect the economic interests of all parties, including the State.

IV. FINDINGS AND DECISION

A. The Conservation of All Natural Resources

1. Formation of the TAU will provide for continued development of the unitized area(s) under the TAU Agreement and will maximize the efficient recovery of oil and gas and minimize the adverse impacts on the surface and other resources, including hydrocarbons, gravel, sand, water, wetlands, and valuable habitat.
2. The unitized development and operation of the leases in this expansion will reduce the amount of land and fish and wildlife habitat that would otherwise be disrupted by individual lease development. This reduction in environmental impacts and preservation of subsistence access is in the public interest.
3. There is potential for environmental impacts associated with development. All unit development must proceed according to an approved plan of development. Additionally, before undertaking any specific operations, the Unit Operator must submit a unit Plan of Operations to the Division and other appropriate state and local agencies for review and approval. The lessees may not commence any drilling or development operations until all agencies have granted the required permits. DNR may condition its approval of a unit Plan of Operations and other permits on performance of mitigation measures in addition to those in the modified leases and the Agreement, if necessary or appropriate. Compliance with mitigation measures will minimize, reduce or completely avoid adverse environmental impacts.

B. The Prevention of Economic and Physical Waste

1. Great Bear submitted geological, geophysical and engineering data to the Division in support of the Application. Division technical staff determined that the TAU area encompasses all or part of multiple potential hydrocarbon accumulations.

2. The available geological, geophysical and engineering data justify including the proposed lands, as described in Section III.A.2. of this decision.


C. The Protection of All Parties in Interest, Including the State

1. The unit formation as approved protects all parties' interests including the people of Alaska who have an interest in the development of the State's oil and gas resources to maximize the economic and physical recovery of the resources.
2. The economic, geological, geophysical, and engineering data that Great Bear provided reasonably justify the inclusion of the TAU acreage under the terms of the applicable regulations governing formation, expansion, and operation of oil and gas units and participating areas (11 AAC 83.301–395) and the terms and conditions under which these lands were leased from the State.
3. Great Bear provided evidence of reasonable effort to obtain joinder of any proper party to the Agreement.
4. Great Bear and Borealis hold all interest in the unit area necessary to give effective control of operations to Great Bear Pantheon LLC, as unit operator.
5. The unit formation meets the requirements of 11 AAC 83.303.
6. The Division complied with the public notice requirements of 11 AAC 83.311.
7. The unit formation will not diminish access to public and navigable waters beyond those limitations (if any) imposed by law or already contained in the oil and gas leases covered by this decision.
8. The TAU Agreement provides for additional expansions and contractions of the unit area in the future, as warranted by data obtained by exploration or otherwise. The TAU Agreement thereby protects the public interest, the rights of the parties, and the correlative rights of adjacent landowners.
9. The approved unit is effective November 12, 2020.

For the reasons discussed in this Findings and Decision, I hereby approve the TAU formation.

A person affected by this decision may appeal it, in accordance with 11 AAC 02. Any appeal must be received within 20 calendar days after the date of “issuance” of this decision, as defined in 11 AAC 02.040(c) and (d) and may be mailed or delivered to Corri A. Feige, Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501; faxed to 1-907-269-8918, or sent by electronic mail to dnr.appeals@alaska.gov. This decision takes effect immediately. An eligible person must first appeal this decision in accordance with 11 AAC 02 before appealing this decision to Superior Court. A copy of 11 AAC 02 may be obtained from any regional information office of the Department of Natural Resources.

If you have any questions regarding this decision, contact Ryan King with the Division at 907-269-8799, or by email at ryan.king@alaska.gov.

DocuSigned by:

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11/12/2020

Tom Stokes
Director
Division of Oil and Gas

Date

cc: Department of Law

V. ATTACHMENTS

1. Talitha Unit Proposed Exhibit A: Description of Lands within the Proposed Unit
2. Talitha Unit Proposed Exhibit B: Map of Proposed Unit Area
3. Talitha Unit Proposed Exhibit G: Plan of Exploration

1. Talitha Unit Proposed Exhibit A

Description of Lands within the Proposed Talitha Unit

Exhibit A

TALITHA UNIT TRACT TABLE

Unit Tract Number	ADL	Legal Descriptions	Unitized Acres	Royalty Rate	ORRI Owners and Interests	Working Interest Owners and Interests	Lease Primary Expiration Date
1	391658	<u>T. 5N., R. 12E., Umiat Meridian, Alaska.</u> Section 1, Surveyed by Protraction, All; Section 2, Surveyed by Protraction, All; Section 3, Surveyed by Protraction, All, including the beds of the unnamed lakes; Section 10, Surveyed by Protraction, All, including the beds of the unnamed lakes; Section 11, Surveyed by Protraction, All, including the beds of the unnamed lakes; Section 12, Surveyed by Protraction, All; Section 13, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 14, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 15, Surveyed by Protraction, All, including the beds of the unnamed lakes;	640.00 640.00 640.00 640.00 640.00 640.00 640.00 <u>640.00</u> 5760.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	4/30/2021

Exhibit A

TALITHA UNIT TRACT TABLE

Unit Tract Number	ADL	Legal Descriptions	Unitized Acres	Royalty Rate	ORRI Owners and Interests	Working Interest Owners and Interests	Lease Primary Expiration Date
2	391660	<u>T 5N, R 13E, Umiat Meridian, Alaska.</u> Section 1, Surveyed by Protraction, All; Section 2, Surveyed by Protraction, All including the bed of the unnamed lake; Section 3, Surveyed by Protraction, All including the bed of the unnamed lake; Section 10, Surveyed by Protraction, All including the beds of the unnamed lakes; Section 11, Surveyed by Protraction, All including the beds of the unnamed lakes; Section 12, Surveyed by Protraction, All; Section 13, Surveyed by Protraction, All; Section 14, Surveyed by Protraction, All including the bed of the unnamed lake; Section 15, Surveyed by Protraction, All including the bed of the unnamed lake;	640.00 640.00 640.00 640.00 640.00 640.00 640.00 640.00 640.00 <u>640.00</u> 5760.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	4/30/2021

Exhibit A

TALITHA UNIT TRACT TABLE

Unit Tract Number	ADL	Legal Descriptions	Unitized Acres	Royalty Rate	ORRI Owners and Interests	Working Interest Owners and Interests	Lease Primary Expiration Date
3	391661	<u>T 5N, R 13E, Umiat Meridian, Alaska.</u> Section 4, Surveyed by Protraction, All; Section 5, Surveyed by Protraction, All; Section 6, Surveyed by Protraction, All; Section 7, Surveyed by Protraction, All; Section 8, Surveyed by Protraction, All including the bed of the unnamed lake; Section 9, Surveyed by Protraction, All including the bed of the unnamed lake; Section 16, Surveyed by Protraction, All including the bed of the unnamed lake; Section 17, Surveyed by Protraction, All including the bed of the unnamed lake; Section 18, Surveyed by Protraction, All including the bed of the unnamed lake; 	640.00 640.00 626.00 628.00 640.00 640.00 640.00 640.00 <u>631.00</u> 5725.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	4/30/2021

Exhibit A

TALITHA UNIT TRACT TABLE

Unit Tract Number	ADL	Legal Descriptions	Unitized Acres	Royalty Rate	ORRI Owners and Interests	Working Interest Owners and Interests	Lease Primary Expiration Date
4	391679	<u>T 6N, R 13E, Umiat Meridian, Alaska.</u> Section 4, Surveyed by Protraction, All, including the beds of the unnamed lakes; Section 5, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 6, Surveyed by Protraction, All; Section 7, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 8, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 9, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 16, Surveyed by Protraction, All; Section 17, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 18, Surveyed by Protraction, All, including the bed of the unnamed lake; 	640.00 640.00 610.00 612.00 640.00 640.00 640.00 640.00 615.00 5677.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	4/30/2021

Exhibit A

TALITHA UNIT TRACT TABLE

Unit Tract Number	ADL	Legal Descriptions	Unitized Acres	Royalty Rate	ORRI Owners and Interests	Working Interest Owners and Interests	Lease Primary Expiration Date
5	391680	<u>T 6N, R 13E, Umiat Meridian, Alaska.</u> Section 22, Surveyed by Protraction, All, including the beds of the unnamed lakes; Section 23, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 24, Surveyed by Protraction, All, including the bed of the Sagavanirktok River; Section 25, Surveyed by Protraction, All, including the beds of the Sagavanirktok River and the unnamed lake; Section 26, Surveyed by Protraction, All, 640.00 acres; Section 27, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 34, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 35, Surveyed by Protraction, All; Section 36, Surveyed by Protraction, All, including the bed of the unnamed lake; 5760.00	640.00 640.00 640.00 640.00 640.00 640.00 640.00 640.00 640.00 5760.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	4/30/2021
6	391960	<u>T 6N, R 12E, Umiat Meridian, Alaska.</u> Section 1, Surveyed by Protraction, All; Section 2, Surveyed by Protraction, E1/2; Section 11, Surveyed by Protraction, NE1/4, including the bed of the unnamed lake; Section 12, Surveyed by Protraction, N1/2, including the bed of the unnamed lake; 1440.00	640.00 320.00 160.00 320.00 1440.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	11/30/2022

Exhibit A

TALITHA UNIT TRACT TABLE

Unit Tract Number	ADL	Legal Descriptions	Unitized Acres	Royalty Rate	ORRI Owners and Interests	Working Interest Owners and Interests	Lease Primary Expiration Date
7	391961	<u>T 6N, R 12E, Umiat Meridian, Alaska.</u> Section 10, Surveyed by Protraction, S1/2; Section 11, Surveyed by Protraction, SW1/4; Section 14, Surveyed by Protraction, W1/2, including the bed of the unnamed lake; Section 15, Surveyed by Protraction, All, including the bed of the unnamed lake;	320.00 160.00 320.00 <u>640.00</u> 1440.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	11/30/2022
8	391962	<u>T 6N, R 12E, Umiat Meridian, Alaska.</u> Section 11, Surveyed by Protraction, SE1/4, including the bed of the unnamed lake; Section 12, Surveyed by Protraction, S1/2, including the bed of the unnamed lake; Section 13, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 14, Surveyed by Protraction, E1/2, including the beds of the unnamed lakes;	160.00 320.00 640.00 <u>320.00</u> 1440.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	11/30/2022
9	391971	<u>T 6N, R 12E, Umiat Meridian, Alaska.</u> Section 22, Surveyed by Protraction, All; Section 23, Surveyed by Protraction, W1/2, including the bed of the unnamed lake; Section 26, Surveyed by Protraction, NW1/4; Section 27, Surveyed by Protraction, N1/2;	640.00 320.00 160.00 <u>320.00</u> 1440.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	11/30/2022
10	391972	<u>T 6N, R 12E, Umiat Meridian, Alaska.</u> Section 23, Surveyed by Protraction, E1/2, including the bed of the unnamed lake; Section 24, Surveyed by Protraction, All; Section 25, Surveyed by Protraction, N1/2; Section 26, Surveyed by Protraction, NE1/4;	320.00 640.00 320.00 <u>160.00</u> 1440.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	11/30/2022

Exhibit A

TALITHA UNIT TRACT TABLE

Unit Tract Number	ADL	Legal Descriptions	Unitized Acres	Royalty Rate	ORRI Owners and Interests	Working Interest Owners and Interests	Lease Primary Expiration Date
11	391973	<u>T 6N, R 12E, Umiat Meridian, Alaska.</u> Section 26, Surveyed by Protraction, SW1/4; Section 27, Surveyed by Protraction, S1/2; Section 34, Surveyed by Protraction, All, including the bed of the unnamed lake; Section 35, Surveyed by Protraction, W1/2;	160.00 320.00 640.00 <u>320.00</u> 1440.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	11/30/2022
12	391974	<u>T 6N, R 12E, Umiat Meridian, Alaska.</u> Section 25, Surveyed by Protraction, S1/2; Section 26, Surveyed by Protraction, SE1/4; Section 35, Surveyed by Protraction, E1/2; Section 36, Surveyed by Protraction, All;	320.00 160.00 320.00 <u>640.00</u> 1440.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	11/30/2022
13	392786	<u>T 6N, R 13E, Umiat Meridian, Alaska.</u> Section 19, Unsurveyed, All; Section 20, Unsurveyed, W1/2; Section 29, Unsurveyed, NW1/4; Section 30, Unsurveyed, N1/2;	618.00 320.00 160.00 <u>310.00</u> 1408.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	1/31/2025
14	392787	<u>T 6N, R 13E, Umiat Meridian, Alaska.</u> Section 20, Unsurveyed, E1/2; Section 21, Unsurveyed, All, including the bed of the unnamed lake; Section 28, Unsurveyed, N1/2, including the bed of the unnamed lake; Section 29, Unsurveyed, NE1/4;	320.00 640.00 320.00 <u>160.00</u> 1440.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	1/31/2025

Exhibit A

TALITHA UNIT TRACT TABLE

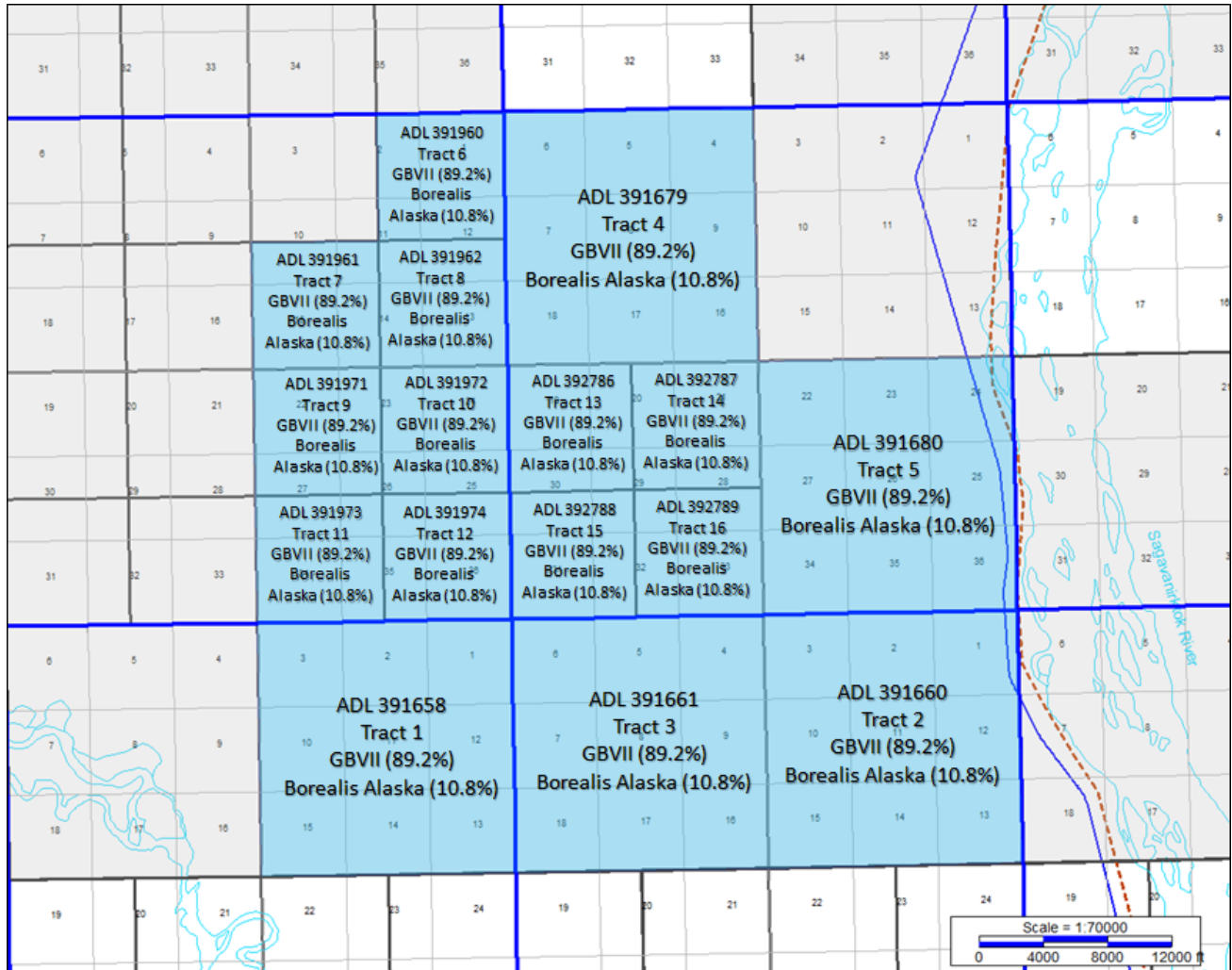
Unit Tract Number	ADL	Legal Descriptions	Unitized Acres	Royalty Rate	ORRI Owners and Interests	Working Interest Owners and Interests	Lease Primary Expiration Date
15	392788	<u>T 6N, R 13E, Umiat Meridian, Alaska.</u> Section 29, Unsurveyed, SW1/4; Section 30, Unsurveyed, S1/2; Section 31, Unsurveyed, All; Section 32, Unsurveyed, W1/2;	160.00 310.00 623.00 <u>320.00</u> 1413.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	1/31/2025
16	392789	<u>T 6N, R 13E, Umiat Meridian, Alaska.</u> Section 28, Unsurveyed, S1/2, including the bed of the unnamed lake; Section 29, Unsurveyed, SE1/4; Section 32, Unsurveyed, E1/2; Section 33, Unsurveyed, All;	320.00 160.00 320.00 <u>640.00</u> 1440.00	12.5000%	None	Great Bear Petroleum Ventures II, LLC: 89.200% Borealis Alaska, LLC: 10.800%	1/31/2025

2. Talitha Unit Proposed Exhibit B

Map of Proposed Talitha Unit Area

Exhibit B

UNIT MAP



3. Talitha Unit Proposed Exhibit G: Plan of Exploration



FIRST PLAN OF EXPLORATION

TALITHA UNIT

Great Bear Pantheon, LLC
3705 Arctic Blvd, Suite 2324
Anchorage, AK 99503

September 1, 2020

Pre-Unit Exploration Activities (Shared History for Alkaid and Talitha Units)

The area around and including the proposed Talitha Unit has seen sparse exploration drilling activity over the last 50+ years with a total of less than 10 wells in the adjacent area penetrating the primary zones of interest at Talitha. The exploration activity can be divided into three distinct phases: 1) early post Prudhoe discovery stepout drilling from 1969 – 1974; 2) focused exploration tests from 1980 – mid 90's driven by increased 2D seismic data coverage; and 3) post 2010 Great Bear Petroleum entrance driving regional 3D seismic coverage across the initial vast leasehold. ARCO dominated Phase 1 with tests that focused on expanding the Kuparuk River Unit play to the south and east. Various operators drilled wells in Phase 2 with continued focus on the Kuparuk and emerging interest in Brookian reservoirs. Phase 3 has been dominated by Great Bear Petroleum 3D seismic acquisition and drilling of 2 stratigraphic test wells at Alcor (2012) and Merak (2012) and a focused exploration test at Alkaid (2015, flow test in 2019).

Phase 1 Activity:

ARCO drilled 2 wells proximal to the Talitha project. The Toolik #1 (TD 10814') and #2 (TD 8700') were drilled in 1969. Both were plugged and abandoned having drilled to the targeted Kuparuk equivalent depth. Mudlog shows in the Brookian section were noted with Kuparuk sands penetrated but not tested.

ARCO drilled the North Franklin Bluffs test in 1973 (TD 3500') penetrating shallow Brookian aquifers and no hydrocarbons. Mobil drilled West Kadleroshilik #1 (TD 4566') in 1974 on the east side of the Sagavanirktok River southeast of the Talitha project. The well penetrated shallow Brookian aquifer with no hydrocarbons.

Phase 2 Activity:

Significant increases in 2D seismic data acquisition in the late 70's – early 1990's in the Central North Slope area south of the Kuparuk River Unit and Prudhoe Bay Unit led to focused exploration tests by various operators. ARCO drilled the Pipeline State #1 well in 1988. Originally planned to TD at approximately 13,000', the well was drilled to 10,460' into the Miluveach Formation. Significant oil shows were encountered through the Brookian Campanian strata and in the Kuparuk sands with 4 zones of interest cored. The well was plugged and abandoned with no tests. Conoco drilled Sequoia #1 in 1992 with a TD at 8910' in the Jurassic Kingak Formation. Significant oil shows were recorded in the lower Brookian Torok and Seabee equivalent strata and the Kuparuk Formation. The well was plugged and abandoned with no tests. Publicly available well files through 2013 did not include elogs across the Kuparuk interval for either well. Great Bear found reference to an LWD across the Kuparuk intervals at Pipeline State #1 and Sequoia #1. After a request to AOGCC to follow up with Conoco (then holding ARCO's legacy data), LWD data was delivered.

ENI drilled the Magiorre #1 well in 2007 with a TD of 9500'. The well was highly deviated through Brookian strata and recorded modest oil shows. The well was plugged and abandoned with no tests.

Talitha Unit Agreement

Page 2 of 5

Exhibit G – Unit Plan

Phase 3 Activity:

Great Bear Petroleum's entry into North Alaska in October 2010 brought renewed focus to the Central North Slope area. Great Bear's technical focus investigating the potential for source rock resource play development and more traditional conventional plays was coupled with a regional 3D acquisition plan that spanned 5 successive years of acquisition beginning in 2012. Great Bear drilled two stratigraphic test wells in 2012, Alcor #1 (TD 10,812') and Merak #1 (TD 11,094'). Both wells were drilled into the Ivishak Formation with whole core samples taken in the Hue shale, GRZ/HRZ, Kingak, Shublik and Ivishak Formations. Oil shows were recorded in Campanian and Kuparuk strata correlative to the reservoir zones at Alkaid and Talitha.

Three modern 3D datasets had been acquired, merged and uniformly processed by mid 2014. The significant seismic anomalies were observed throughout the Campanian section over much of the Great Bear lease position. RSI (global high tech geophysical contractor) was engaged to model the seismic responses that were observed. AVO and detailed calibrated Inversion methods were employed to derisk and rank the portfolio of seismically defined prospects.

Alkaid #1 (TD 8,595') was drilled during the 2014-2015 Winter drilling season. The well targeted a conventional reservoir of Campanian age and was planned to TD through the Kuparuk Formation. The primary zone of interest in the Campanian exhibited a strong geophysical response modeled to be light oil. Operational challenges and the historic Sag River aufeis triggered flooding of the Dalton Highway forced an early TD call and cessation of operations and suspension of the well.

Great Bear continued expanding the 3D seismic database through 2015 and 2016. In February 2019, Alkaid was reentered and flow tested. A limited zone was perfed and stimulated achieving sustained flow of 35api oil (typed to Cretaceous source). Following the successful flow test in 2019, the Campanian play was proven productive and also proved that reservoir, light oil could be resolved with modern 3D analytical methods. In mid 2019, eSeis (Houston based petrophysical and geophysical experts with deep Alaska experience) were engaged to further resolve and quantify the growing potential within the Campanian and Kuparuk intervals with a heavy focus on Alkaid and Talitha charged reservoir mapping aimed at optimizing development planning.

TALITHA UNIT EXPLORATION PROGRAM

The Unit Operator intends to undertake the following activities over the next three years.

A. Non-Drilling Activities

- Reprocessing approximately 50 square miles of merged 2012 - 2016 3D datasets, which will include Pre-Stack Depth Migration (PSDM) for the Talitha Unit area (in conjunction with approximately 50 square miles for the Alkaid Unit the total reprocessed will be approximately 100 square miles). PSDM has not previously been applied to any of our

3D dataset. This methodology, when combined with the logging while drilling data will reveal areas of better reservoir quality and assist in selecting the interval for any lateral drilling.

- This work is expected to be completed prior to spudding of Talitha A in order to inform decision associated with the target interval for any lateral or stimulation. It is highly unlikely that this review will result in the relocation of the drillsite or tophole location of Talitha A, but it could result in slight deviation from a true vertical well before hitting TVD. Upon completion of reprocessing, Unit Operator shall deliver a complete copy to the Director.
- Expanded review of Campanian reservoir characterization and productivity potential within the Talitha Unit area (to be complete within the next year)
- Update our gas to oil ratio (GOR) model for Talitha and develop a gas handling strategy for future Talitha Unit development within a range of oil production estimates (to be complete within the next year)
- Engage an outside engineering firm to produce an engineering study on a conceptual “hot tap” of TAPS within or near the Alkaid and Talitha Units, working in close consultation with Alyeska Pipeline Service Company (to be complete within the next year)

B. Drilling Activities

The next exploration wells in the Talitha Unit, the Talitha A and Talitha B wells, will be drilled as winter ice road/pad supported operations. They will be vertical wells drilled to the base of the Kuparuk sand. Each well location has been selected to penetrate an attractive portion of both the Shelf Margin Deltaic play and the Kuparuk play, with an emphasis on the Shelf Margin Deltaic play potential. Each well will be logged, cased, and will likely be fracture stimulated at the most prospective interval encountered. If logistically possible, a small lateral may be drilled into a prospective interval as well. A decision on a lateral and/or stimulation will be made based on seasonal timing and logging results. The log suites are expected to include: Quad Combo, FMI, RFT, rotary sidewall cores, NMRI, Caliper, and possibly others. Unless the results are significantly below expectations, the wells are expected to be suspended for potential use as a producer. The results from Talitha A and Talitha B will be evaluated to determine next steps toward development and production.

Talitha A – Drillsite located on ADL 391658; U05N012E03; at approximately 69° 49' 23.11" N, -149° 5' 25.90 W.

Operations are scheduled to take place in Winter 2021, spudding approximately February 1, 2021, pending fundraising, from an ice pad approximately 8 miles west of the Dalton Highway. A vertical well will be drilled to a depth of approximately 10,200 feet to the base of the Kuparuk sand.

Talitha B – Drillsite located on ADL 391972 (on border with 391971); U06N012E23; at approximately 69° 51' 44.88" N, -149° 4' 8.88" W.

Operations are scheduled to take place in Winter 2022, spudding approximately February 1, 2022, pending fundraising, from an ice pad approximately 7 miles west of the Dalton Highway. A vertical well will be drilled to a depth of approximately 9,920 feet to the base of the Kuparuk sand.

For the development and production of both the Shelf Margin Deltaic play and the Kuparuk play in the Talitha Unit, the plan for reservoir recovery, pressure maintenance and produced fluid processing is a standard miscible water alternating gas (MWAG) plan. Miscible gas will be re-injected as will water with every other well serving as an injector. Additional water will be added as necessary to ensure a 1:1 void replacement. The fuel gas source will be natural gas from associated produced gas, casing head gas, etc.

C. Work Commitment

Performance Bond – The Unit Operator shall post a performance bond in the amount of \$3.3 million no later than one (1) year from the Effective Date of this agreement, or September 15, 2021, which is earlier. If the bond is not posted by the deadline, the unit automatically terminates.

Wells – One well must be drilled within two years, or two wells within four years to maintain the unit. If one well is not drilled within two years, then the bottom holes of the two wells must be no less than two miles from each other. Each commitment well must be a new grassroots well. If the well(s) are not drilled as scheduled, the bond will be surrendered in full to the Department of Natural Resources on behalf of the State, and the Unit will be automatically terminated after five (5) years from the Effective Date of this agreement. Each well must be drilled and logged to the base of the Kuparuk Formation or its equivalent, as seen at 10,375' MD in the Pipeline St. 1 well (API # 50-223-20016). Each well, at a minimum, must be logged with a typical log suite, including gamma ray, resistivity, and porosity logs. For any interval where logging suggests the potential for significant oil production, rotary sidewall or full core samples must be acquired and fluid samples acquired in a flow test or by downhole sampling tool at reservoir conditions.